

REMARKS

This Amendment is in response to the Final Office Action mailed January 3, 2007. In the Office Action, the Examiner objected claims 1, 3-7, 10-21, 23-27, 30-41, 43-47, 50-66, and 68, and rejected claims 1, 3-7, 10-14, 18-21, 23-27, 30-34, 38-40 and 69 under 35 U.S.C. § 103. In this response, claims 1, 21, 41, and 69 have been amended. Claims 18-20 and 38-40 have been cancelled. No claims have been added. Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Claim Objections

The Examiner objects to claims 1, 3-7, 10-21, 23-27, 30-41, 43-47, 50-66, and 68 for informalities. In particular, the Examiner noted that the claims presented in the amendment filed October 6, 2006 were inconsistent with a previous amendment filed May 9, 2006. Applicants have amended the claims to be consistent with the May 9th amendment, and as indicated by the Examiner. Thus, Applicants respectfully requests that the Examiner withdraw the objection to claims 1, 3-7, 10-21, 23-27, 30-41, 43-47, 50-66, and 68.

Rejection Under 35 U.S.C. § 103

The Examiner rejects claims 1, 3-7, 10-14, 18-21, 23-27, 30-34, 38-40 and 69 under 35 U.S.C. § 103(a) as being unpatentable over Acharya, et al. (US 6,154,493) in view of Benamara (US 6,128,413). Applicants respectfully disagree.

Acharya describes capturing an image in a digital camera and separate color planes (Acharya, Abstract). Red and blue pixels are modified by green neighbor pixels, and a wavelet transform of the new G1, G2, R-G1, and B-G2 color planes is performed (Acharya, column 4, lines 21-61). The transformed data is then quantized, encoded, and compressed, so that the

complete image may be restored by reversing the previously performed operations (Acharhya, Figure 6).

Benamara describes a predetermined bit allocation for a compressed image file (Benamara, column 2, lines 38-49). Image data is interpolated to RGB, color transformed to YIQ, and compressed (Benamara, column 8, lines 22-60). Based on the available storage space in the predetermined bit allocation, some pixel data may not be stored in the image (Benamara, column 2, lines 38-49). The data is then reconstructed into an image corresponding to the entire stored image (Benamara, column 8, line 63 to column 9, line 34).

Amended claim 1 recites:

In a digital imaging system, a method for distributed digital image processing, the method comprising:

recording luminosity information at a first device, for representing an image that has been digitally captured at the first device;

without performing color interpolation at the first device, generating compressed luminosity information at the first device by applying a wavelet transform compression to individual color planes that comprise the luminosity information, followed by applying quantization and compression to the luminosity information;

packaging said compressed luminosity information, in a plurality of data packets suitable for progressive transmission of image data corresponding to varying levels of photographic significance, with header information identifying the individual color planes that comprise the luminosity information;

progressively transmitting a first set of data packets from said plurality of data packets of said compressed luminosity information to a second device, while remaining data packets from said plurality of data packets are maintained at the first device;

restoring said luminosity information from said first set of data packets of said compressed luminosity information at the second device;

converting said luminosity information at the second device into a color image, including performing color interpolation at the second device, corresponding to the progressively transmitted data packets received by the second device; and

in response to receipt of a second set of data packets from the remaining data packets, said second set of data packets corresponding to a higher level of photographic significance, converting said lower-quality representation of the image into a higher-quality representation by synchronizing said

lower-quality representation with said higher-quality representation at the second device.

(Emphasis Added)

That is, claim 1 recites that luminosity information representing an image is packaged in a plurality of data packets suitable for progressive image transmission corresponding to varying levels of photographic significance of the image. A first set of data packets is progressively transmitted to a second device, while the remaining data packets are maintained at the first device. The luminosity information from the first set of data packets is then converted into a color image based on the first set of received data packets. In response to the receipt of a second set of data packets, which corresponds to data of a higher level of photographic significance, a higher-quality representation of the image is created by synchronizing the sets of data packets.

Applicants respectfully submit that Acharya and Benemara, alone or in combination, fail to teach, suggest, or even address “packaging said compressed luminosity information, in a plurality of data packets suitable for progressive transmission of image data corresponding to varying levels of photographic significance,” “progressively transmitting a first set of data packets from said plurality of data packets of said compressed luminosity information to a second device, while remaining data packets from said plurality of data packets are maintained at the first device,” or “in response to receipt of a second set of data packets from the remaining data packets, said second set of data packets corresponding to a higher level of photographic significance, converting said lower-quality representation of the image into a higher-quality representation by synchronizing said lower-quality representation with said higher-quality representation at the second device.”

Acharya provides for a system that compresses image color plains where the compressed color plains may be decompressed to obtain the original image (Acharaya, Figure 2). Benemara

also describes arranging image data by color channel up to a given bit allocation, where excess image data bits are not stored for an image (Benemara, Figure 5A, elements 526-530). The concept of “packaging said compressed luminosity information, in a plurality of data packets suitable for progressive transmission of image data corresponding to varying levels of photographic significance” is completely absent from Acharya and Benemara.

Furthermore, because Acharya and Benemara do not describe the claimed “packaging,” the references must also fail to describe or suggest “progressively transmitting a first set of data packets from said plurality of data packets of said compressed luminosity information to a second device, while remaining data packets from said plurality of data packets are maintained at the first device,” or “in response to receipt of a second set of data packets from the remaining data packets, said second set of data packets corresponding to a higher level of photographic significance, converting said lower-quality representation of the image into a higher-quality representation by synchronizing said lower-quality representation with said higher-quality representation at the second device.”

The Examiner states:

Acharya ('493) and Benamara fail to specifically disclose transmitting said compressed sensor information by first transmitting a lower-quality representation of the image recorded at the first device. However, Acharya ('493) discloses compressed image signals could be downloaded to the computer (figure 8). It would have been obvious that lower quality image is converted into higher quality image in order to let the user could see a higher quality on the display.

(Final Office Action, mailed 1/3/2007, pages 7-8).

Although Acharya does describe that an image may be stored on a computer (*See* Figure 8),

Acharya describes that:

Computer system 810 has a system bus 813 which facilitates information transfer to/from the processor 812 and memory 811 and a bridge 814 which couples to an

I/O bus 815. I/O bus 815 connects various I/O devices such as a display adapter 816, disk 818 and an I/O port 817, such as a serial port. Many such combinations of I/O devices, buses and bridges can be utilized with the invention and the combination shown is merely illustrative of one such possible combination.

In one embodiment of the invention, the compressed images can be decompressed/recovered to a perceptually lossless version on computer system 810 by suitable application software (or hardware), which may utilize processor 812 for its execution. A full resolution RGB image may be created by color interpolation data and then be rendered visually using a display adapter 816 into a perceptually lossless image 850.
(Acharaya, column 13, lines 35-48)

Thus, Acharya merely states that image data, compressed as G1, G2, R-G1, and B-G2 color planes may be transformed and restored in a lossless manner at another device (Acharya, column 13, lines 41-48). The G1, G2, R-G1, and B-G2 color planes, however, are not describes as being packaged “in a plurality of data packets suitable for progressive image transmission of image data corresponding to varying levels of photographic significance.” For sake of argument, even if Acharya provides for varying image quality levels, Acharaya would still fail to teach or suggest “progressively transmitting a first set of data packets ... while remaining data packets from said plurality of data packets are maintained at the first device” or “in response to receipt of a second set of data packets from the remaining data packets, said second set of data packets corresponding to a higher level of photographic significance, converting said lower-quality representation of the image into a higher-quality representation by synchronizing said lower-quality representation with said higher-quality representation at the second device,” as claimed by the Applicants.

Thus, Acharya and Benamara, alone or in combination, fail to render claim 1, and its associated dependent claims, obvious.

Claim 21, as amended, recites:

In a digital imaging system, a method for deferring digital image processing, the method comprising:

- recording sensor information from an image sensor at a first device, for representing an image that has been recorded at the image sensor of the first device;
- compressing said sensor information prior to color processing by applying a transformation compression to individual bit planes that comprise the sensor information, for generating compressed sensor information at the first device;
- packaging said compressed sensor information in a plurality of data packets suitable for progressive transmission with header information identifying the individual bit planes that comprise the sensor information;
- without having performed color processing at the first device, progressively transmitting one or more of said plurality of data packets of said compressed sensor information to a second device in a wireless manner using a packet-based communication protocol; and
- decompressing said compressed sensor information at the second device, whereupon said sensor information may thereafter be processed into a color image corresponding to the progressively transmitted data packets received by the second device.

(Emphasis Added)

As discussed above, with respect to claim 1, Acharya and Benamara, alone or in combination, fail to teach or suggest “packaging said compressed luminosity information in a plurality of data packets suitable for progressive image transmission,” “progressively transmitting one or more of said plurality of data packets of said compressed luminosity information,” “restoring said luminosity information from said one or more of said plurality of data packets,” or “converting said luminosity information ... to provide a color image corresponding to the progressively transmitted data packets received by the second device.” Because claim 21 claims “packaging said compressed sensor information in a plurality of data packets suitable for progressive transmission,” “progressively transmitting one or more of said plurality of data packets of said compressed sensor information to a second device,” and “decompressing said compressed sensor information at the second device, whereupon said sensor

information may thereafter be processed into a color image corresponding to the progressively transmitted data packets received by the second device,” claim 21, and its associated dependent claims, are rendered obvious by Acharya and Benamara, alone or in combination.

Claim 41, as amended, recites:

An imaging system providing deferred image processing, the system comprising:

- an imager having a sensor for recording luminosity information for a visual image captured by the imager, said luminosity information comprising luminosity values recorded by the sensor;

- a compressor module for compressing said luminosity information by applying a transformation compression to each individual bit planes that comprise the luminosity information, for generating compressed luminosity information at the imager without having performed color processing, wherein the compressed luminosity information is packaged into a plurality of data packets suitable for progressive transmission in a bit stream with header information identifying the individual bit planes that comprise the luminosity information;

- a wireless communication link for progressively transmitting one or more of said plurality of data packets of said compressed luminosity information to a target device in a wireless manner using a packet-based communication protocol; and

- a decompression module for decompressing said compressed luminosity information at the target device, whereupon said sensor information may thereafter be processed into a color image corresponding to the progressively transmitted data packets received by the target device.

(Emphasis Added)

As discussed above, with respect to claim 1, Acharya, Benamara, and Tran, alone or in combination, fail to teach or suggest “packaging said compressed luminosity information in a plurality of data packets suitable for progressive image transmission,” “progressively transmitting one or more of said plurality of data packets of said compressed luminosity information,” “restoring said luminosity information from said one or more of said plurality of data packets,” or “converting said luminosity information ... to provide a color image corresponding to the progressively transmitted data packets received by the second device.”

Because claim 41 claims “the compressed luminosity information is packaged into a plurality of data packets suitable for progressive transmission,” “a wireless communication link for progressively transmitting one or more of said plurality of data packets of said compressed luminosity information to a target device,” and “said sensor information may thereafter be processed into a color image corresponding to the progressively transmitted data packets received by the target device,” claim 41, and its associated dependent claims, are rendered obvious by Acharya and Benamara, alone or in combination.

Claim 69, as amended, recites:

In a digital imaging system, a method for distributed digital image processing, the method comprising:

- recording luminosity information at a first device, for representing an image that has been digitally captured at the first device;

- while deferring color interpolation to a second device, generating compressed luminosity information at the first device by applying a wavelet transform compression to individual color planes that comprise the luminosity information, followed by applying quantization and compression to the luminosity information;

- packaging said compressed luminosity information in a plurality of data packets suitable for progressive transmission with header information identifying the individual color planes;

- progressively transmitting one or more of said plurality of data packets of said compressed luminosity information to the second device;

- restoring said luminosity information from said one or more of said plurality of data packets said compressed luminosity information at the second device; and

- converting said luminosity information at the second device into a color image, including performing color interpolation at the second device, to provide a color image corresponding to the progressively transmitted data packets received by the second device.

(Emphasis Added)

As discussed above, with respect to claim 1, Acharya and Benamara, alone or in combination, fail to teach or suggest “packaging said compressed luminosity information in a

plurality of data packets suitable for progressive image transmission,” “progressively transmitting one or more of said plurality of data packets of said compressed luminosity information,” “restoring said luminosity information from said one or more of said plurality of data packets,” or “converting said luminosity information ... to provide a color image corresponding to the progressively transmitted data packets received by the second device.” Because claim 69 claims “packaging said compressed luminosity information in a plurality of data packets suitable for progressive transmission,” “progressively transmitting one or more of said plurality of data packets of said compressed luminosity information to the second device,” and “converting said luminosity information at the second device into a color image ... to provide a color image corresponding to the progressively transmitted data packets received by the second device,” claim 69 is not rendered obvious by Acharya and Benamara, alone or in combination.

Applicant respectfully requests that the Examiner withdraw the rejection of claims 1, 3-7, 10-14, 18-21, 23-27, 30-34, 38-40 and 69 under 35 U.S.C. § 103(a) as being unpatentable over Acharya, et al. in view of Benamara.

The Examiner rejects claims 15-17, 35-37, 41, 43-47, 50-66, and 68 under 35 U.S.C. § 103(a) as being unpatentable over Acharya in view of Benamara, and further in view of Tran (US 6,202,060).

Tran describes a portable digital assistant (PDA) that converts hand written text to electronic data (Tran, Abstract). An optional component of a PDA, as described by Tran, is a camera or scanner (Tran, Column 6, lines 25-48). Furthermore, the PDA is provided with a wireless transceiver for communicating data, in the form of data packets, over a cellular network (Tran, Column 8, lines 27-52). Although the PDA may be supplied with a camera, Tran is

completely silent as to the packaging, progressive image transfer, and synchronizing as claimed by the Applicants. Thus, Tran fails to remedy the shortcomings of Acharya and Benemara, and fails to render claims 1, 21, and 41, and thus dependent claims 15-17, 35-37, 41, 43-47, 50-66, and 68, obvious under § 103.

Applicants respectfully request that the Examiner withdraw the rejection of claims 15-17, 35-37, 41, 43-47, 50-66, and 68 under 35 U.S.C. § 103(a) as being unpatentable over Acharaya, in view of Benamara, and further in view of Tran.

Conclusion

Applicant reserves all rights with respect to the applicability of the doctrine of equivalents. Applicant respectfully requests that a timely Notice of Allowance be issued in this case. If a telephone interview would expedite the prosecution of this application, the Examiner is invited to contact William L. Jaffe at (714) 557-3800.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: September 4 2007

By /William W. Schaal/

William W. Schaal
Reg. No. 39,018
Tel.: (714) 557-3800 (Pacific Coast)